Creating A Greener Energy Future For the Commonwealth

DOER
Massachusetts Department of Energy Resources

State Policy Updates:

Massachusetts Biofuels Mandate

Biomass/Forest Sustainability and Carbon Study

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The Second Annual TIMBR Conference on Cellulosic Biofuels

University of Massachusetts, Amherst

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Primary Drivers for Clean Energy Policy

- **Green Communities Act**
  - Expands EE delivery mechanisms and goals
  - RPS – expansion and strengthening targets
  - Net metering provisions
  - Wind Siting Commission
- **Global Warming Solutions Act**
  - 2020 commitments – 10-25% below 1990 levels
  - 2050 commitments – 80% or more below 1990 levels
- **Oceans Management Act**
  - Provides zoning-like planning of state waters
  - Identifies presumptive areas for wind development
- **Clean Energy Biofuels Act**
  - Mandate for advanced biofuels
  - Paves way for transition to LCFS

Clean Energy Biofuels Act

Key Provisions of the Act

- Gas Tax Exemption for Cellulosic Biofuel
- Massachusetts Biofuels (Biodiesel) Mandates
  - Heating Oil
  - Diesel Fuel
- Establish MOU and work towards a regional 11-state Low Carbon Fuel Standard

MA Biofuels Mandate
Lifecycle GHG Reduction

Statutory Criteria and Regulatory Deliberation

- Biofuel must demonstrate at least a **50% reduction** in GHG emissions compared to displaced conventional fuel, *inclusive of indirect impacts*.
- Waste feedstocks were exempt from detailed lifecycle analysis.
- DOER was not in a position to directly engage in science and modeling of GHG reductions (esp. indirect impacts), but awaited opportunities to evaluate protocols being developed by U.S. EPA and CARB (California).

Interpretation and Adoption of U.S. EPA RFS-2 GHG Protocol

EPA Protocol: GHG Reductions from Baseline Petroleum (announced February 2010)

Feedstock	2012	2017	2022
Waste	86%	86%	86%
Soy	24%	31%	57%

DOER will allow compliance with combination of waste and soy, so that on a yearly average a 50% reduction is met. This would imply that *for every 100 gallons of soy biodiesel, at least 72 gallons of waste biodiesel would need to be used*.

MA Biofuels Mandate
Volumetric Requirements

Massachusetts Heating Oil and Diesel Fuel Markets

Sales Volume, gals/year (EIA, 2008-2009 average)

Heating Oil	495,000,000 gallons
Diesel Fuel	378,000,000 gallons
Total	873,000,000 gallons

Heating Oil sales peak in winter months; diesel fuel sales are steady throughout year.

Volumetric Demand for MA Biofuels Mandate

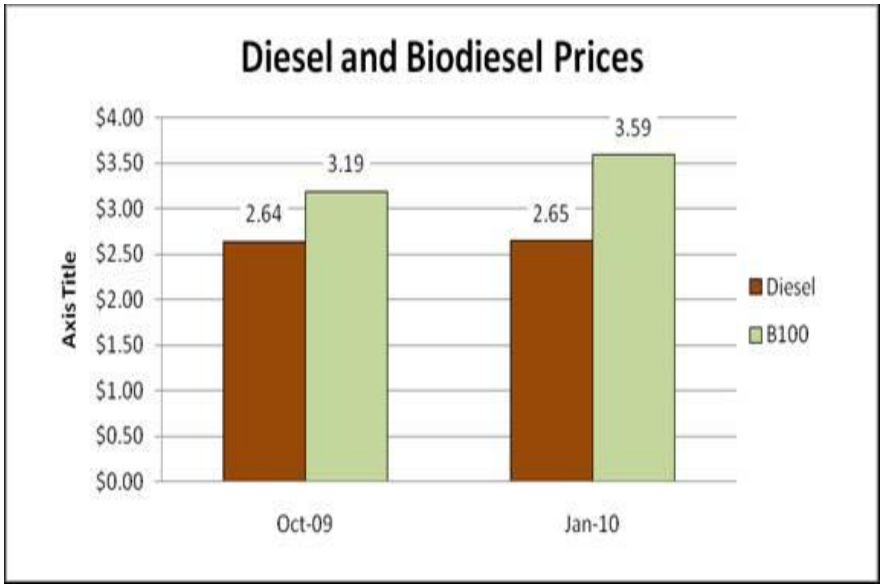
Mandate		Volume of Neet Biodiesel (B100), gals/year
Start Date	Percentage	
July 2010	2%	17.5 million
July 2011	3%	26.2 million
July 2012	4%	34.9 million
July 2013	5%	43.7 million

MA Biofuels Mandate
Price Issues

Biodiesel Cost Data

Price Differential (B100 relative to Diesel)

October 2009	$0.55/gal
January 2010	$0.94/gal



From: U.S. DOE, EERE – January 2010 Clean Cities Report

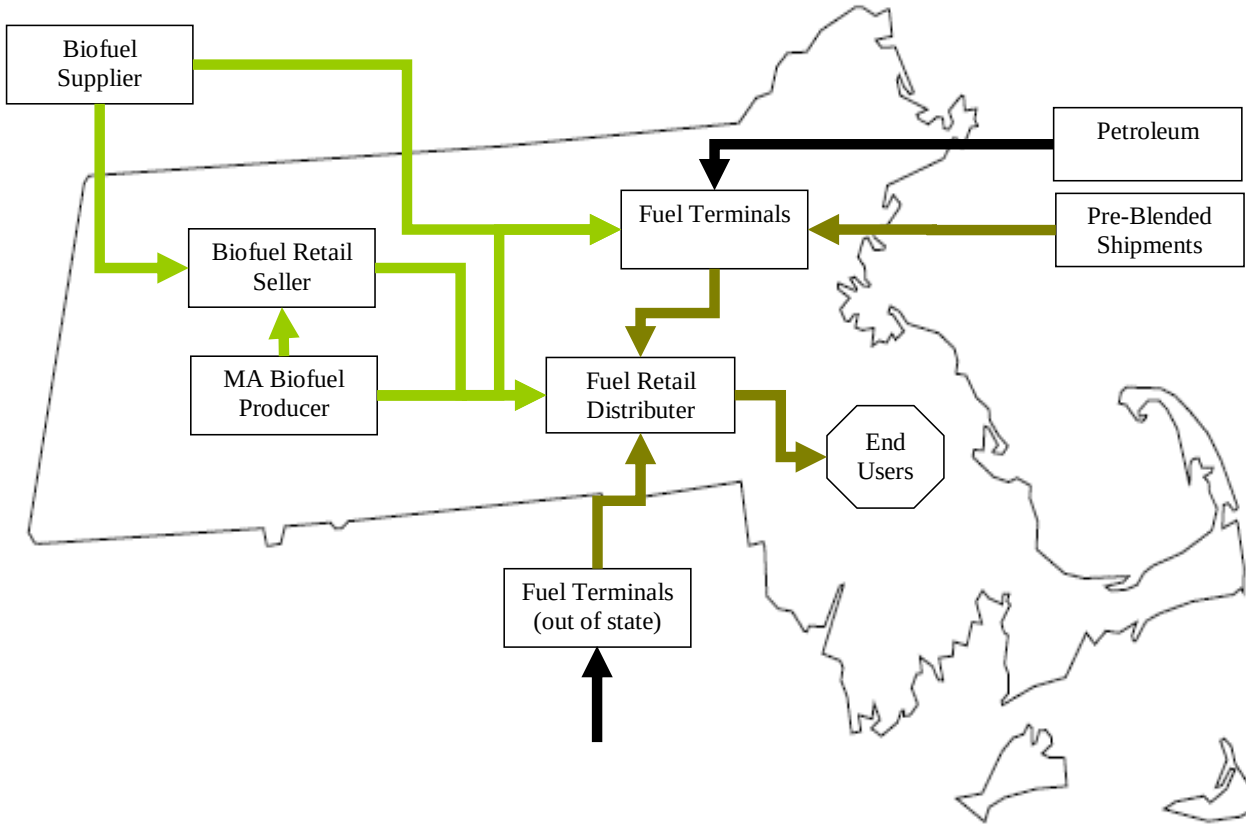
Price Differential will be highly dependent on *federal Biodiesel Blenders Credit ($1.00/gal)* which expired January 1, 2010. Renewal of Credit is unsure, especially post 2010. Prices currently probably do not reflect price changes after expiration.

MA Biofuels Mandate
Petroleum/Biofuel Flows

Petroleum and biofuel flows into and around MA are complicated.

Fuel markets are national/regional. “Boutique” fuels can compromise supply reliability.

Imports from out-of-state terminals are significant in volume and challenging for program implementation.



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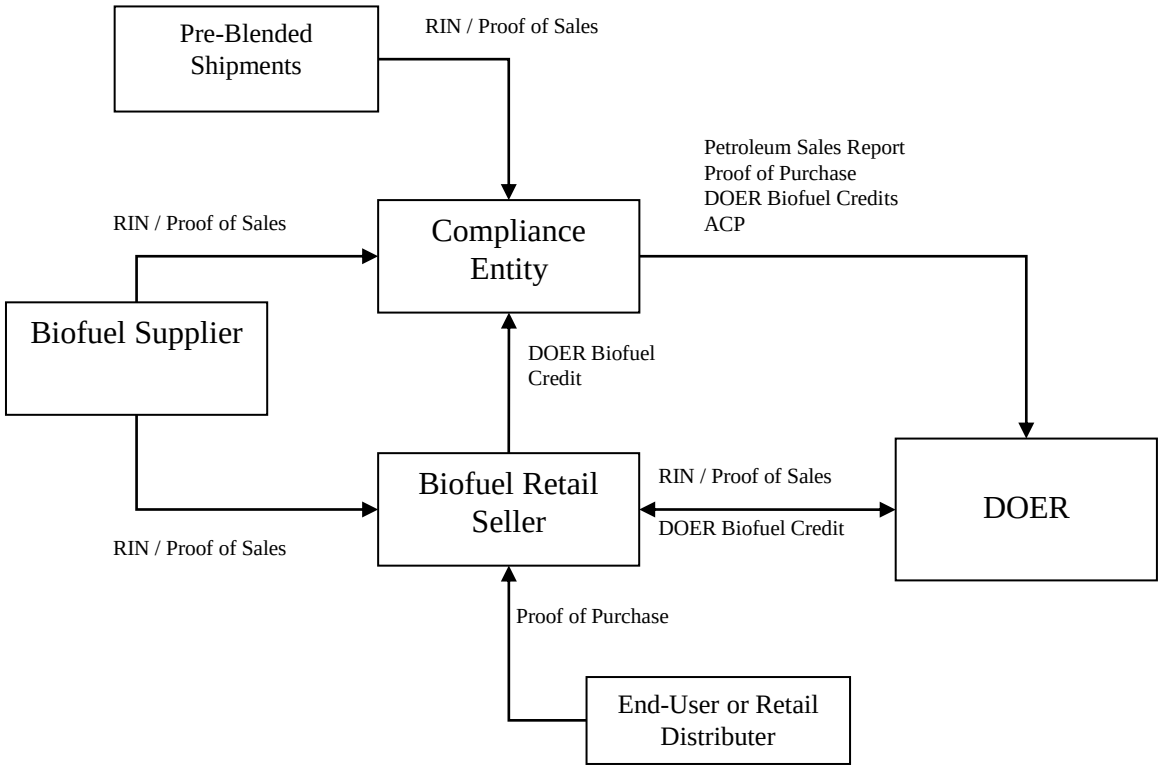
MA Biofuels Mandate Compliance Tracking



DOER is in the process of identifying compliance entities and other market participants.

Compliance forms and biofuel credit documentation are being prepared. Auditable backup sales documents will provide enforcement.

MA Biofuels Mandate
Program Launch

Early Action Year: Mandate to begin July 2010, but first year will be implemented as an Early Action Year.

- Compliance will not be obligatory
- Biofuel use in first year will count towards obligation in second year

- Compliance obligation will fall primarily on petroleum terminals
  - Compliance on fuel delivered to MA from out-of-state terminals remains under study
  - Compliance on fuel from Buckeye Pipeline (New Haven to Springfield) remains under study
  - Terminals can meet compliance by pre-blending sufficient biofuel into fuel sold, or by purchasing biofuels "credits" from retail biofuel suppliers to end-use customers in MA.
- Mandate must be met separately for heating oil and diesel fuel markets.
- Compliance in each market to be met on basis of the annual average blend.
- Cost impact will be capped by Alternative Compliance Fee

Biomass/Forest Sustainability and Carbon

Context/Background

- Biomass electric power plants receive public/ratepayer subsidy through RPS program and Renewable Energy Certificates.
- Three large biomass electric power plants have been proposed in MA.
- Concerns have been raised with regard to the availability of woody biomass feedstock to support an emerging biomass economy, and the impacts on our forestlands.
- Net carbon emissions from biomass use is complex and must be well understood and used to inform policymaking.

Applicability to Cellulosic Biofuels

- Cellulosic ethanol may increase demand for woody biomass and compete for the feedstock with electric power plants and thermal applications.
- "Waste" feedstocks (agricultural, paper/solid waste, wood wastes) and closed-loop energy crops have very different forest/carbon impacts and economic profiles. Such (non-forest derived) feedstocks are not under review.

Biomass – Observations

What's good about biomass?

- Biomass presents a potentially large indigenous energy resource in MA.
- Biomass can be effectively used for non-intermittent baseload power generation, and for CHP, heating, district energy, and cellulosic biofuels - offers a non-fossil substitute for coal and fuel oil.
- Biomass creates substantial local and sustained economic development.

What's problematic about biomass?

- Biomass has air emissions (unlike solar, wind, etc.).
- Biomass impacts forests and calls for strict forest harvesting regulations and broader forest policy to maintain full range of forest services for nature and humans.
- Biomass is a finite resource, and total demand pressure on forests needs to be properly constrained.

What's not well understood about biomass?

- What are net impacts of biomass on carbon emissions, and how does forest management and the allowable re-sequestration timeframe impact this assessment?

Massachusetts Approach

Department of Energy Resources
Executive Office of Energy and Environmental Affairs
Department of Environmental Protection
Department of Conservation and Recreation

Step back …. study science …. establish prudent policy …. move forward

- EEA Secretary asked DOER to integrate "sustainability" criterion in RPS regulations for eligible biomass fuel
- DOER enacted suspension of new RPS qualifications for woody biomass units
- DOER commissioned comprehensive science-based study of forestry and carbon accounting issues
- DCR completing Forest Visioning Process and revisions to Forest Cutting Practices Act

Biomass Sustainability and Carbon Policy Study

- Commissioned Study Team in November 2009
- Most likely the most comprehensive and deliberate investigation of these issues to date worldwide
- Team is rooted in forestry conservation and science
  - Lead: Manomet Center for Conservation Sciences
  - Members:
    - Pinchot Institute for Conservation
    - The Forest Guild
    - Biomass Energy Resource Center
    - Independent natural resource economists

Biomass Sustainability and Carbon Policy Study

- Main Tasks of Study
  - Sustainable Forest Management and Ecological Implications of Biomass Harvesting
  - Biomass Resource Supply under Market Economic Conditions and Patterns of MA Forestland Ownership
  - Carbon Sequestration of Forests with and without Forest Management
  - Net Effect of Biomass Energy on Atmospheric Carbon Balance
  - U.S. and International Policies with Regard to Biomass and Net Carbon Emissions

Biomass Sustainability and Carbon Policy Study

- Study will be completed in June 2010
- Expert Advisory Team will review study's methodologies and results
- DOER/EEA currently considering additional scientific review
- Study will be released to public – DOER/EEA working on logistics for public outreach
- Study will not be a policy document, but will provide the science and analysis on which to base prudent policy

DOER/EEA Activity – Post Study

- Expectations
  - Study will not give a simple answer (i.e. biomass “good” or biomass “bad”).
  - Study will provide forestry conditions and practices, if any, under which biomass may be acceptably harvested.
  - Study will provide analysis of lifecycle carbon accounting under applicable harvesting and energy use scenarios, and over a range of acceptable re-sequestration timeframes.
- Policy Development
  - Is there a path forward for biomass based on sound forestry and climate science?
  - If so, what are the necessary regulatory frameworks needed to direct development along this path?
  - What are the monitoring and enforcement requirements to assure the regulatory framework is followed, and what are the enforcement capacities of the applicable state agencies?
  - How does the MA framework extend to the regional forest conditions and governmental jurisdictions?

Questions/Comments

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